

REMARKS/ARGUMENTS

Reconsideration of the present application, as amended, is respectfully requested.

The January 31, 2003 Office Action and the Examiner's comments have been carefully considered. In response, claims are cancelled and amended, and remarks are set forth below in a sincere effort to place the present application in form for allowance. The amendments are supported by the application as originally filed. Therefore, no new matter is added.

Inasmuch as the present amendment raises no new issues for consideration, and, in any event places the present application in condition for allowance or in better condition for consideration on appeal, its entry under the provisions of 37 C.F.R. 1.116 is respectfully requested.

PRIOR ART REJECTIONS

In the Office Action claims 1, 2 and 5 are rejected under 35 USC 103 as being unpatentable over Japanese Patent Publication No. JP 06-267,855 in view of JP 09-129,553 (incorrectly identified in the Office Action as 19-129,553), and further in view of USP 5,094,885 (Selbrede). Claim 3 is rejected under 35 U.S.C. 103 as being unpatentable over the references applied

against claims 1 and 2 above, and further in view of USP  
5,458,322 (Kulkaski et al). Claim 4 is rejected under 35 U.S.C.  
103 as being unpatentable over the references cited against  
claims 1 and 2, and further in view of European Patent  
Application No. 840,358.

In response, claim 3 is cancelled, limitations from claim 3  
are incorporated into claim 1, and additional limitations are  
added to claim 1 to more clearly define the present claimed  
invention over the cited references. Claim 1 now recites that  
the jaws (14), the springs (16) and the detachable actuating  
means (12) are positioned only on the back surface side (Sa) of  
each of the wafers. The limitations added to claim 1 are clearly  
supported by the present application in paragraphs 0010, 0012,  
0034, 0043 and 0044, and in Figs. 3a, 3b, 4a, 4b and 4c, inter  
alia.

The present claimed invention as defined by independent  
claim 1, is directed to an epitaxial growth furnace including a  
sealed chamber and a pair of wafer holders for holding a pair of  
semi-conductor wafers within the chamber. Each of the wafer  
holders are defined as including an opening for exposing one of  
the surface areas of the wafers to the reaction chamber, an  
opening flange adapted for engagement with a chamfered tapered  
face of a whole peripheral edge of one of the wafers on a side of

the surface area thereof, a plurality of jaws for detachably engaging with an outer periphery of one of the wafers on a back surface side of the surface area thereof, a plurality of springs for respectively thrusting the jaws toward a center of the opening, and detachable actuating means for locking each of the jaws in a released position against respective thrust forces from the springs, wherein the jaws, the springs and the detachable actuating means are positioned only on the back surface side of each of the wafers.

According to the present claimed invention as recited in amended claim 1, the jaws (14), the springs (16) and the detachable actuating means (12), which constitute moving parts for holding each of the wafers, are positioned only on the back surface side (Sa) of each of the wafers. As a result, source gas does not contact these moving parts and there is no deposit of a reaction product which might cause particle contamination. In addition, even if the reaction product is deposited on the moving parts so that the reaction product peels off during a wafer removing operation or the like, there is no danger of pieces of the reaction product falling on the surface area of the wafer thereby contaminating the wafer having an epitaxial layer formed thereon because the jaws, spring and detachable actuating means

are positioned only on the back surface side of each of the wafers.

Japanese Patent Publication No. 06-267,855 discloses an epitaxial growth furnace in which a susceptor 12 is adapted to hold a substrate 11 with the insertion of a disc type protective retainer 13 which has a shape corresponding almost with the shape of the substrate retaining recess 12A of the susceptor 12. Therefore, in this apparatus the substrate is held on the susceptor by a stationary part (retainer 13) which includes no moving part for detachably holding the substrate on the susceptor as is the case with the present claimed invention.

The other references of record, that is, Selbrede and JP 09-129,553 also fail to disclose, teach or suggest the particular construction in which the jaws (14), the springs (16) and the detachable actuating means (12), which constitute moving parts for holding each of the wafers, are positioned only on the back surface side (Sa) of each of the wafers, so that the source gas does not contact these moving parts and there is not a deposit of a reaction product which would cause particle contamination.

Selbrede also fails to disclose a holding mechanism comprising jaws, springs and detachable actuating means.

Kulkaski et al fails to disclose that moving parts for holding a wafer are positioned only on the back surface side of the wafer.

Ballance et al. only discloses a stationery edge ring (134) on which a substrate is simply held and fails to disclose any moving parts for holding a substrate on the ring.

As noted in item 6 of the Office Action, Minagawa discloses a vapor epitaxial growth device. Minagawa fails, however, to disclose any moving parts for holding a substrate on the susceptor.

That is, the present claimed invention as defined by amended claim 1 is patentable over the cited references because the references do not disclose, teach or suggest, when taken either alone or in combination inter alia,:

an epitaxial growth furnace including a sealed chamber and a pair of wafer holders, wherein the wafer holders include:

an opening for exposing one of side surface areas of the wafers to said reaction chamber;

an opening flange adapted for engagement with a chamfered tapered face of a whole peripheral edge of one of said wafers on the side of said surface area thereof;

a plurality of jaws for detachably engaging with an outer periphery of one of the wafers on a back surface side of said surface area thereof;

a plurality of springs for respectively thrusting said jaws toward a center of said opening; and/or

detachable actuating means for locking each of said jaws in a released position against respective thrust forces from said springs, wherein said jaws, said springs and said detachable actuating means are positioned only on said back surface side of each of said wafers (see claim 1, lines 16-32).

In view of the foregoing, claim 1 and claims 2, 4 and 5 which are dependent thereon are patentable over the cited references under 35 U.S.C. 102 as well as 35 U.S.C. 103.

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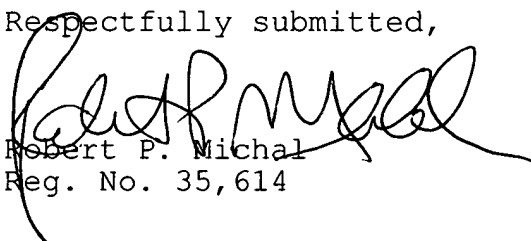
In view of the foregoing, entry of this Amendment under the provisions of 37 C.F.R. 1.116, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner disagrees with any of the foregoing, the Examiner is respectfully requested to point out where there is support for a contrary view.

Appln. No. 09/744,363  
Amendment dated July 31, 2003  
Reply to Office Action of January 31, 2003

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



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